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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

04-AMCP-0384

AUG 02 2004

Mr. Darin Rice, Acting Program Manager
Hazardous Waste and Toxics Reduction Program
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504

Dear Mr. Rice:

CERTIFICATION OF EVALUATION OF STATE-ONLY CRITERIA FOR 200 AREA EFFLUENT TREATMENT FACILITY DELISTING PETITION

References: (1) Ecology ltr. to K. A. Klein, RL, from D. Rice, "Petition to Exempt Waste-Transmittal," dtd. July 1, 2004.

(2) RL ltr. to D. Rice, Ecology, from K. A. Klein, "Transmittal of 200 Area Effluent Treatment Facility (ETF) Delisting Modification, Revision 1," 04-AMCP-0320, dtd. May 27, 2004.

As requested in Reference (1), enclosed is the certification for the evaluation of state-only criteria for the 200 Effluent Treatment Facility (ETF) originally provided as an attachment to the 200 Area ETF Delisting Modification, Revision 1 [(Reference (2)]. This certification of the evaluation and associated data tables, in conjunction with the original certification provided in 2001, satisfies the certification requirement for the complete petition.

Through consultation with the State of Washington Department of Ecology and the U.S. Environmental Protection Agency, the U.S. Department of Energy, Richland Operations Office (RL) and Fluor Hanford, Inc. (FHI) made some minor modifications to the tables. These changes do not affect the conclusion of the evaluation. Please note that a more conservative approach was used in the evaluation of toxicity. This is in contrast with Washington Administrative Code 173-303-100(5)(b)(i) which states that, "If the NIOSH RTECS or other data sources do not agree on the same category, then the category arrived at using the NIOSH RTECS will be used to determine the toxic category." RL and FHI consider the use of these more conservative values case-specific, appropriate, and limited to evaluation of toxicity in regard to this delisting petition only. Since the current conservative analysis demonstrates that the waste is not dangerous, an analysis using less conservative data would show the same result.

In addition, and as requested, the state-only criteria evaluation information has been both dated and annotated as a supplemental to 200 ETF Delisting Petition Modification, DOE/RL-98-62, Revision 1.

If you have questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971, or Joel Hebdon, Director, Office of Environmental Services, on (509) 376-6657.

Sincerely,

Keith A. Klein
Manager

AMCP:RDH

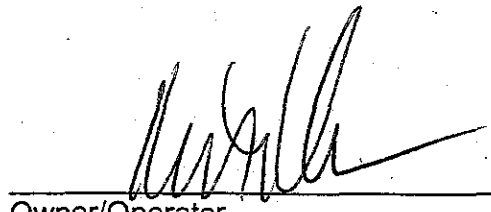
Enclosure

cc w/encl:
D. Bartus, EPA
N. Ceto, EPA
S. Harris, CTUIR
J. Hyatt, FHI
R. Jim, YN
A. Prignano, FHI
P. Sobotta, NPT
M. A. Wilson, Ecology
Administrative Record
Environmental Portal, A3-01

200 AREA EFFLUENT TREATMENT FACILITY DELISTING PETITION CRITERIA EVALUATION AND DATA TABLES

OPERATOR CERTIFICATION

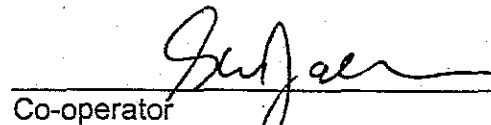
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



7/2/04

Owner/Operator
Keith A. Klein, Manager
U.S. Department of Energy,
Richland Operations Office

Date



7/15/04

Co-operator
Ronald G. Gallagher
President and Chief Executive Officer
Fluor Hanford

Date

Evaluation of State-Only Criteria for 200 Area Effluent Treatment Facility Treated Effluents

(supplemental to DOE/RL-98-62, Revision 1)

One of the remaining technical questions identified during Ecology review of the 200 Area Effluent Treatment Facility (ETF) delisting draft proposal was whether the treated effluent wastes, which might be excluded from the federal/authorized state RCRA program, would exhibit state-only criteria for toxicity or persistence. As a means to quantitatively evaluate this question, the state-only WT (toxicity) and WP (persistence) codes were calculated pursuant to Washington Administrative Code (WAC) 173-303-100.

State-only Toxic Criteria

For the WT code, Table 1 includes all constituents identified in the draft proposed rule as verification constituents. For each constituent, the toxic category is calculated according to book designation procedure methodology in WAC 173-303-100(5)(b). Assuming each verification constituent is present in the excluded waste at the delisting level, the contribution of each constituent to the total equivalent concentration is calculated by dividing the proposed delisting level by the toxic category divisor specified in WAC 173-303-100(5(b)(ii). Finally, the contribution of each constituent is summed to calculate the equivalent concentration of the waste stream.

The methodology used is intended to be a conservative, worst-case evaluation, based on two key assumptions. First, it is assumed that ALL verification constituents are present at the proposed delisting level. This is considered bounding, in that it is highly unlikely that all constituents (even a substantial majority) would ever be present in the treated effluent at the delisting level. This is confirmed by historical data accumulated pursuant to the verification sampling requirements of the existing delisting, and the ST4500 discharge permit.

Second, where toxicity values for multiple chemical forms or cogeners of a verification constituent are provided, the most toxic form or congener is selected. In the case of Polychlorinated Biphenyls (PCBs), all PCBs are assumed to be the most toxic Aroclor 1248. In the case of metals, where toxicity for the parent metal as well as the chloride form is provided, the most toxic category is selected. There is no evidence to suggest that any metals are present in treated effluent in the chloride form, so where a chloride form is more present than the parent metal, this assumption is conservative and bounding. In fact, the chemistry of ETF treatment strongly suggests that any metal halides would likely be converted to oxide forms in the UV/OX treatment process. Therefore, to the extent that metal chloride toxicity is greater than the parent metal form, the conservative selection of toxicity values is bounding.

When individual contributions to the waste stream equivalent concentration are summed, the equivalent concentration, a value of 0.0002 weight percent is obtained. This is

significantly lower than the designation threshold of 0.001 weight percent. Therefore, it is a reasonable and defensible conclusion that treated effluents that meet delisting criteria do not designate as state-only toxic criteria wastes.

State-only Persistence Criteria

For the persistence criteria codes, a similar analysis has been performed. Table 2 contains only those verification constituents that are either halogenated organic compounds (HOCs) or polycyclic aromatic hydrocarbons (PAHs) for evaluating the applicability of the WP01 and WP02 codes, and polycyclic aromatic codes. The weight percent of each such compound is calculated based on the assumption that the verification constituent is present in the treated effluent at the delisting level. Further, it is assumed that all other compounds represented in the treatability group are also present at the same concentration; in other words, the weight percent of the representative constituent is multiplied by the number of compounds in that treatability group. The resulting concentrations for each of the PAH and HOC groups is totaled and compared to the designation criteria. It should be noted that this assumption, that all constituents within the PAH and HOC treatability groups are present at the concentration of the verification constituent, is highly conservative. For example, treatability group 11 contains 81 compounds; it is not plausible that all 81 compounds would be present in treated effluents at the verification constituent concentration.

Based on these calculations, the following results are obtained and compared to the designation levels of WAC 173-303-100(6):

Constituent class	Calculated total (wt. %)	Designation level (wt. %)
Polyaromatic hydrocarbons	0.00204	1.0
Halogenated organic compounds	0.00098	0.01

For both PAHs and HOCs, the very conservative bounding concentrations are well below the designation level. Therefore, it is a reasonable and defensible conclusion that treated effluents that meet delisting criteria do not designate as state-only persistence criteria wastes.

Table 1

Evaluation of State-Only Toxicity Criteria for 200 ETF
(supplemental to DOE/RL-98-62, Revision 1)

Treatability group	Proposed delisting constituents	CAS #	Proposed delisting level (mg/l)	Fish LC50 (mg/L)	Oral (Rat) LD50 (mg/kg)	Inhalation (Rat) LC50 (mg/L)	Dermal (Rabbit) LD50 (mg/kg)	Toxicity Category	WT divisor	Equivalent Concentration (mg/l)	Equivalent Concentration (wt. percent)
1	Cresol [Cresylic acid]	1319-77-3	1.2	12.8, E	1454, R	NA	200, R	C	1000	0.0012	0.00000012
2	2,4,6-trichlorophenol	88-06-2	0.36	0.73, E	820, R	NA	NA	B	100	0.0036	0.00000036
3, 15, 15a	Benzene	71-43-2	0.06	4.6, E	930, R	NA	>8260, R	C	1000	0.00006	0.000000006
4	Chrysene	218-01-9	0.56	NA	NA	NA	NA	NA			
5, 5a, 16	Hexachlorobenzene	118-74-1	0.002	22, H	3500, R	3.6, R	NA	C	1000	0.000002	2E-10
6b, 14	Hexachlorocyclopentadiene	77-47-4	0.18	0.0067, E	300, H	0.018, R	430, R	X	1	0.18	0.000018
7a	Dichloroisopropyl ether [Bis(2-Chloroisopropyl) ether]	108-60-1	0.06	NA	240, R	12.8, H	3309, R	C	1000	0.00006	0.000000006
8	Di-n-octylphthalate	117-84-0	0.48	0.00618, H	30000, H	NA	NA	X	1	0.48	0.000048
9a	1-Butanol	71-36-3	2.4	1730, E	790, R	24, R	3400, R	D	10000	0.00024	0.000000024
9	Isophorone	78-59-1	4.2	145, E	1000, H	7.0, H	1500, H	C	1000	0.0042	0.00000042
10a	Diphenylamine	122-39-4	0.56	3.79, E	1120, R	NA	NA	C	1000	0.00056	0.000000056
10b	p-Chloroaniline	106-47-8	0.12	11, E	200, H	2.34, R	360, R	C	1000	0.00012	0.000000012
10c	Acetonitrile	75-05-8	1.2	1000, E	175, H	NA	980, H	C	1000	0.0012	0.00000012
10d	Carbazole	86-74-8	0.18	0.93, E	>5000, H	NA	NA	B	100	0.0018	0.00000018
10e	N-Nitrosodimethylamine	62-75-9	0.02	940, E	27, H	0.24, R	NA	B	100	0.0002	0.00000002
10f	Pyridine	110-86-1	0.024	1.1, E	800, H	12.9, H	1121, R	C	1000	0.000024	2.4E-09
11	Lindane [gamma-BHC]	58-89-9	0.003	0.0017, H	76, H	NA	50, H	X	1	0.003	0.0000003
12	Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260	PCBs 1336-36-3	0.0005	0.305, E	4000, R	NA	NA	B			
12	Aroclor 1016	12674-11-2		0.134, H	2300, R	NA	NA	B			
12	Aroclor 1221	11104-28-2		1.17, E	3980, R	NA	NA	C			
12	Aroclor 1232	11141-16-5		1.9, E	4470, R	NA	4470, H	C			
12	Aroclor 1242	53469-21-9		0.010, E	794, H	NA	8650, H	A			
12	Aroclor 1248	12672-29-6	0.0005	0.0034, E	11000, R	NA	11000, H	X	1	0.0005	0.00000005
12	Aroclor 1254	11097-69-1		0.00032, E	1010, R	NA	NA	X			
12	Aroclor 1260	11096-82-5		0.021, E	1300, H	NA	1300, H	A			
13, 6a	Carbon tetrachloride	56-23-5	0.018	1.97, H	2350, R	50.3, R	>20000, R	C	1000	0.000018	1.8E-09

Table 1

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18a	Tetrahydrofuran	109-99-9	0.56	2160, E	1650, R	53.1, H	NA	D	10000	0.000056	5.6E-09
19	Acetone	67-64-1	2.4	4376, E	5800, R	NA	NA	NA			
20	Carbon disulfide	75-15-0	2.3	4, E	1200, R	1, R	NA	B	100	0.023	0.0000023
21, 22	Barium	7440-39-3	1.6	>500, E	NA	NA	NA	NA			
21, 22	Barium Chloride	10361-37-2		42.7, E	118, R	NA	NA	C	1000	0.0016	0.00000016
21, 22	Beryllium	7440-41-7	0.045	0.150, H	NA	NA	NA	B	100	0.00045	0.000000045
21, 22	Beryllium Chloride	7787-47-5		0.380, E	9.7, H	NA	NA	B			
21, 22	Nickel	7440-02-0	0.45	0.050, E	NA	NA	NA	A	10	0.045	0.0000045
21,22	Nickel Chloride	7718-54-9		0.050, E	105, R	NA	NA	A			
21, 22	Silver	7440-22-4	0.11	0.0062, E	>5000, H	NA	NA	X	1	0.11	0.000011
21, 22	Silver Chloride	7783-90-6		0.51, E	NA	NA	NA	B			
21, 22	Vanadium	7440-62-2	0.16	0.160, E	NA	NA	NA	B	100	0.0016	0.00000016
21,22	Vanadium Chloride	7632-51-1		NA	160, R	NA	NA	C			
21, 22	Zinc	7440-66-6	6.8	0.24, E	NA	NA	NA	B			
21, 22	Zinc Chloride	7646-85-7		0.066, E	350, R	NA	NA	A	10	0.68	0.000068
21, 22	Arsenic	7440-38-2	0.015	9.9, E	763, R	NA	NA	C			
21, 22	Arsenic Chloride	7784-34-1		NA	48, R	NA	NA	B	100	0.00015	0.000000015
21, 22	Cadmium	7440-43-9	0.011	0.0021, E	225, H	0.025, R	NA	X	1	0.011	0.0000011
21,22	Cadmium Chloride	10108-64-2		< 0.0005, E	88, R	NA	NA	X			
21, 22	Chromium	7440-47-3	0.068	100, E	NA	NA	NA	D			
21, 22	Chromium Chloride	10025-73-7		9.9, E	440, R	NA	NA	C			
21,22	Chromium Trioxide	1333-82-0		0.18, E	25, H	0.087, H	30, H	A	10	0.0068	0.00000068
21, 22	Lead	7439-92-1	0.09	0.20, E	NA	NA	NA	B	100	0.0009	0.00000009
	Lead Chloride	7758-95-4		0.18, E	>1947, R	NA	NA	B			
21, 22	Mercury	7439-97-6	0.0068	0.005, E	NA	NA	NA	X	1	0.0068	0.00000068
21, 22	Mercury Chloride	7487-94-7		0.005, E	1, R	NA	NA	X			
21, 22	Selenium	7782-49-2	0.11	5.0, E	6700, R	NA	NA	C	1000	0.00011	0.000000011
21, 22	Selenium Chloride	7791-23-3		NA	NA	NA	NA	NA			
23	Fluoride	16984-48-8	1.2	125, E	NA	NA	NA	NA			
23	Sodium Fluoride	7681-49-4		0.317, E	31, R	NA	NA	B	100	0.012	0.0000012
24	Ammonia	7664-41-7	6	0.068, H	350, H	1.39, R	NA	A	10	0.6	0.00006
24	Cyanide	57-12-5	0.48	0.120, E	NA	NA	NA	B			

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24	Sodium Cyanide	143-33-9		0.0463, E	4.7, R	NA	10.4, R	A	10	0.048	0.0000048
25a	Tributyl phosphate	126-73-8	0.12	4.2, E	3000, R	28, R	>3100, R	C	1000	0.00012	0.000000012
										total weight percent:	**0.000222437** *
								*** The total weight percent (0.00022243) is less than 0.001 therefore the waste is not a toxic dangerous waste [WAC 173-303-100(5)(iii)(A)].**			
Individual Aroclors, selected metal chlorides, chromium trioxide, sodium fluoride, and sodium cyanide were added to better characterize toxicity											
Fish data hierarchy: Salmonid>Fathead Minnow>Other Fish Species (WAC 173-303-100)											
Fish LC50 ≥24 hrs, Rat Inhalation LC50 ≤4 hrs, Rabbit Dermal LD50 =24 hrs (WAC 173-303-100)											
Databases used: RTECS (rat, rabbit), HSDB (rat, rabbit, fish), ECOTOX (fish)											
R=Registry of Toxic Effects of Chemical Substances (RTECS), National Institute of Occupational Safety and Health (NIOSH).											
http://ccinfoweb.ccohs.ca/rtecs/search.html											
H=Hazardous Substances Data Bank (HSDB), National Library of Medicine (NLM).											
http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB											
E=Ecotoxicology Database (ECOTOX), Environmental Protection Agency (EPA).											
http://www.epa.gov/ecotox/											
NA=Not Available											

Table 2

Evaluation of State-Only Persistence Criteria for 200 ETF
(supplemental to DOE/RL-98-62, Revision 1)

Treatability group	Proposed delisting constituents	CAS #	Proposed delisting level (mg/l)	Chemical Class	Compound count	HOC wt.%	Treatability group total	PAH wt. %	Treatability group total	
2	2,4,6-trichlorophenol	88-06-2	0.36	HOC	14	0.000036	0.000504			
4	Chrysene	218-01-9	0.56	PAH	19			0.000056	0.001064	
5, 5a; 16	Hexachlorobenzene	118-74-1	0.002	HOC	20	0.0000002	0.000004			
6b, 14	Hexachlorocyclopentadiene	77-47-4	0.18	HOC	16	0.000018	0.000288			
7a	Dichloroisopropyl ether [Bis(2-Chloroisopropyl) ether]	108-60-1	0.06	HOC	9	0.000006	0.000054			
10b	p-Chloroaniline	106-47-8	0.12	HOC	5	0.000012	0.00006			
10d	Carbazole	86-74-8	0.18	PAH	54			0.000018	0.000972	
11	Lindane [gamma-BHC]	58-89-9	0.003	HOC	81	0.0000003	0.0000243			
12	Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260	PCBs 1336-36-3	0.0005							
12	Aroclor 1016	12674-11-2								
12	Aroclor 1221	11104-28-2								
12	Aroclor 1232	11141-16-5								
12	Aroclor 1242	53469-21-9								
12	Aroclor 1248	12672-29-6	0.0005	HOC	1	5E-08	0.00000005			
12	Aroclor 1254	11097-69-1								
12	Aroclor 1260	11096-82-5								
13, 6a	Carbon tetrachloride	56-23-5	0.018	HOC	27	0.0000018	0.0000486			
						HOC total (wt. %)	0.00098295	*		
						PAH total (wt. %)			0.002036	**

*** The total weight percent for HOC (0.000983) is less than 0.01 therefore the waste is not persistant [WAC 173-303-100(6)(d)].**

**** The total weight percents for PAH (0.002036) is less than 1.0 therefore the waste is not persistant [WAC173-303-100(6)(d)].**

Individual Aroclors, selected metal chlorides, chromium trioxide, sodium fluoride, an mg/kg

Fish data hierarchy: Salmonid>Fathead Minnow>Other Fish Species (WAC 173-303-100)

Fish LC50 ≥24 hrs, Rat Inhalation LC50 ≤4 hrs, Rabbit Dermal LD50 =24 hrs (WAC 173-303-100)

Databases used: RTECS (rat, rabbit), HSDB (rat, rabbit, fish), ECOTOX (fish)

R=Registry of Toxic Effects of Chemical Substances (RTECS), National Institute of Occupational Safety and Health (NIOSH).
http://ccinfoweb.ccohs.ca/rtecs/search.html

H=Hazardous Substances Data Bank (HSDB), National Library of Medicine (NLM).
http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

E=Ecotoxicology Database (ECOTOX), Environmental Protection Agency (EPA).
http://www.epa.gov/ecotox/

NA=Not Available